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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2006/0264755 A1****Maltz et al.**(43) **Pub. Date: Nov. 23, 2006**(54) **ARTERIAL ENDOTHELIAL FUNCTION
MEASUREMENT METHOD AND
APPARATUS****Publication Classification**(51) **Int. Cl.**
A61B 8/00 (2006.01)(52) **U.S. Cl.** **600/455; 600/437**(76) Inventors: **Jonathan S. Maltz**, Oakland, CA (US);
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(US)(57) **ABSTRACT**

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BERKELEY, CA 94720 (US)**(21) Appl. No.: **11/362,326**(22) Filed: **Feb. 23, 2006****Related U.S. Application Data**(63) Continuation of application No. PCT/US04/29737,
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A "relaxoscope" (100) detects the degree of arterial endothelial function. Impairment of arterial endothelial function is an early event in atherosclerosis and correlates with the major risk factors for cardiovascular disease. An artery (115), such as the brachial artery (BA) is measured for diameter before and after several minutes of either vasoconstriction or vasorelaxation. The change in arterial diameter is a measure of flow-mediated vasomodification (FMVM). The relaxoscope induces an artificial pulse (128) at a superficial radial artery (115) via a linear actuator (120). An ultrasonic Doppler stethoscope (130) detects this pulse 10-20 cm proximal to the point of pulse induction (125). The delay between pulse application and detection provides the pulse transit time (PTT). By measuring PTT before (160) and after arterial diameter change (170), FMVM may be measured based on the changes in PTT caused by changes in vessel caliber, smooth muscle tone and wall thickness.

